



# Public Health

Seattle & King County

HEALTHY PEOPLE. HEALTHY COMMUNITIES.

Dorothy F. Teeter, MHA, Interim Director and Health Officer

## West Nile Virus:

### *Mosquito control on private property*

**Question:** What are the methods of mosquito control that can be used on private property? Is one better than the others?

**Answer:** There are several methods of controlling mosquitoes on private property. Natural methods are preferable prior to considering the use of pesticides. Control of mosquito larvae is generally more effective than trying to control adult mosquitoes.

- **Habitat reduction:** Effective prevention and reduction of adult mosquito populations begins by surveying the property and getting rid of standing water where mosquitoes breed. See the next question to learn about specific and less expensive ways to reduce mosquito breeding areas around your property.
- **Natural predators:** In nature, there are many predators that eat adult mosquitoes or mosquito larvae. These include fish, frogs and other such animals in ponds and wetlands, birds such as swallows, and bats. In confined ponds or animal water troughs, adding goldfish or koi can also be very effective for controlling mosquito larvae. See the question below on adding fish to water.
- **Larviciding:** Larviciding includes the use of biological, biochemical, and chemical control products applied to water sources to kill the immature larvae before they hatch into adult flying mosquitoes. Only adult mosquitoes bite and are capable of transmitting disease such as West Nile virus. Larviciding can be effective if done correctly but it is important to **READ THE LABEL** before using products and to follow state and federal laws as described below.
- **Spraying for adult mosquitoes:** Spraying adult mosquitoes (called "adulticiding") is generally less effective than the methods desired above. Adulticides may be considered due to missed breeding sites, heavy rain, relief from heavy swarms of biting adults or when public health officials have determined the risk from mosquito borne diseases outweigh the potential risks from the use of these products. These insecticides, which include chemicals such as permethrin, resmethrin, and sumithrin, have been evaluated by the Environmental Protection Agency (EPA) to ensure they can be used safely.

#### Environmental Health Services Division

999 Third Avenue, Suite 700 • Seattle, WA 98104-4039

T (206) 205-4394 F (206) 296-0189 • [www.metrokc.gov/health](http://www.metrokc.gov/health)



City of Seattle

Gregory J. Nickels, Mayor



King County

Ron Sims, Executive

**Question: I've heard that West Nile virus is often carried by mosquitoes called "container breeders." What are container breeders and what do I do about them?**

**Answer:** Although mosquitoes that potentially carry the West Nile virus live in most environments, many of them prefer to breed in containers of water such as buckets and bird baths common to many King County backyards. By reducing these sources of water, you'll go a long way towards reducing the numbers of mosquitoes hatching near your windows and in your yard where you and your family spend time.

While we will never get rid of all mosquitoes, it does make sense to reduce artificial breeding habitat in your yard. Follow these steps at least once a week to reduce mosquito breeding habitat (i.e., standing or stagnant water present for longer than 7 days):

- Tip water out of barrels, buckets and wheelbarrows
- Tip out containers what could hold water such as toys, cans or plant saucers
- Empty children's wading pools when not in use
- Change water in birdbaths and animal troughs at least once a week
- Get rid of old used tires
- Clean garden ponds
- Recycle old bottles, buckets, and cans
- Clean leaf-clogged gutters
- Dump water off of tarps and plastic sheeting
- Repair leaky outdoor faucets
- Cover rain barrels with mosquito screens
- Repair ripped windows and door screens and make sure they fit tight
- Consider adding a screen door to doors that often are left open
- Help your elderly or frail neighbors and relatives with these activities

**Question: I have a wetland and a pond on my property. Can I apply a larvicide product to kill mosquito larvae?**

**Answer:** Unless the body of water is completely contained, such as an artificial ornamental fountain or pond and water from the pond cannot flow to a natural water body or constructed drainage system, **permits are required** to apply

larvicides to water. The property owner or a licensed commercial pesticide applicator must obtain the required permit. The National Pollutant Discharge Elimination System (NPDES) Permit for Aquatic Mosquito Control is available from the Washington State Department of Health at no charge. For more information contact Ben Hamilton at 360-236-3364 or visit [www.doh.wa.gov/wnv](http://www.doh.wa.gov/wnv).

You may also need to contact your local drainage or surface water management office to verify if local regulations have additional requirements other than just a NPDES permit. In the phone book government pages, look for your city's Public Works or Utilities section, and under the subheading "drainage" or "storm water."

**Question: I have a small ornamental fountain on my patio and a bird bath in the garden. What can I do to make sure mosquitoes are not breeding there?**

**Answer:** There are several options for fountains, birdbaths, small ornamental ponds or other landscape "water features". The first is to keep water moving by using a pump to create a waterfall, spray, or otherwise circulate the water. This does not need to run continuously; just a couple hours a day will prevent mosquitoes from successfully hatching. Another way is to add goldfish or koi to the pond; these fish love to eat mosquito larvae and are a very effective control method. Goldfish or koi can be purchased inexpensively at most pet stores. For bird baths and small fountains, you could also empty the water each week and refill with fresh water--this is effective because it takes more than a week for mosquito eggs to hatch into adults. See below on the state rules regarding adding fish to non-ornamental waters such as ponds.

**Question: I hired a Commercial Pesticide Applicator to get rid of the mosquitoes on my property, and he said I could use the larvicides available at my local home improvement store in my pond. Since he is a licensed applicator, do I still need the NPDES permit?**

**Answer:** Yes, if the body of water is not completely contained and/or has the potential to flow into streams, wetlands, lakes, constructed drainage systems (including ditches), or other waters. The NPDES permit (see previous question) must be obtained by the property owner or the licensed applicator hired to apply the pesticide. Larvicides (such as Bs, or *Bacillus sphaericus* - trade name VectoLex, or Bti, *Bacillus thuringiensis israelensis*, various trade names) may be used without a permit only in completely contained water features such as artificial ornamental ponds.

**Question: Do commercial pesticide applicators need licenses?**

**Answer:** Yes, from the Washington State Department of Agriculture. Ask to see their current pesticide license to ensure that it is up-to-date. The head of the commercial application business should have a Commercial Pesticide Applicator

license; his/her employees should have a Commercial Operator license. Make sure the applicator has an aquatic, public health or statewide endorsement on their license. One of these endorsements is required for the applicator to apply larvicides to water. Other endorsements are required to apply adulticides. Most common would be the PCO General or Ornamental Insect & Disease Control. The Public Health endorsement also can be used for adulticide applications.

**Question: I've heard that fish are natural mosquito predators. May I add fish to the pond on my property?**

**Answer:** Permits from the State Department of Fish and Wildlife are required before any fish is introduced to natural bodies of water, including ponds and wetlands, on private property. For more information visit [www.wdfw.wa.gov/fish/trnsport.htm](http://www.wdfw.wa.gov/fish/trnsport.htm). You may also call 425-775-1311 and speak to a biologist. Remember that wetlands, ponds and swamps are already likely to have naturally-occurring predators such as fish, birds, amphibians, dragonflies and other insects that help keep the mosquito population under control.

**Question: I've heard that using bleach, vegetable oil, motor oil, or soap in ponds is an effective way to kill mosquito eggs. Is it okay to use these substances in water?**

**Answer:** No, It is not okay to use these substances for mosquito control in water. Bleach, vegetable oil, motor oil and soap are not registered for use as pesticides and cannot be used for control of mosquito larvae or eggs. Mosquito control must comply with federal and other state requirements. It would be illegal to put these substances into waters of the state that are not completely contained without a permit, **even if** they are on private property. Many substances, such as petroleum products, should not be used in a manner that will allow them to get into natural water systems, groundwater, or drainage systems. Furthermore, wetlands, ponds and swamps are likely to have native predators that help keep the mosquito population under control. Bleach, oils, soap, and many other chemicals can be toxic to organisms such as fish, amphibians, and insects, and killing these mosquito predators will do more harm than good. Even products labeled as "biodegradable" or "non-toxic" may be harmful to aquatic organisms.

**Question: My neighbor has lots of mosquitoes on his property. I think they come from his messy garden fountain. Are there any laws or regulations to make him clean it up?**

**Answer:** King County has no enforcement power to make landowners clean up their property to reduce mosquito infestations. You may file a complaint with Public Health's Environmental Health Division by calling 206-205-4394. Though Public Health cannot require the property owner to remove standing water, we can send a letter informing the owner what he or she can do to reduce the habitat, and letting him/her know about the risks of West Nile virus

**Question: I have heard that King County is applying larvicide to some of its stormwater ponds. I have a stormwater pond near my home. Will someone larvicide to kill the mosquitoes there?**

**Answer:** If you believe that the stormwater pond is a source of mosquitoes, call the local jurisdiction, association, agency or property owner responsible for maintenance of the stormwater pond to report your concerns. That may be the city where you live, your homeowners association, or King County, among other owners. If you are not sure who owns the stormwater pond, call your city or county government for more information.

King County's Department of Natural Resources and Parks (DNRP) is continually evaluating its stormwater facilities for the presence of mosquitoes. DNRP is larviciding some ponds where natural predators are inadequate and where the ponds are located near large numbers of people with an elevated risk, such as persons older than 50 years old. Call 206-296-1900 if you have concerns about a DNRP stormwater pond. More information about stormwater ponds may be found at: <http://dnr.metrokc.gov/wlr/dss/rdponds.htm>

**Question: Should I buy a "bug zapper" or some other type of trap to control mosquitoes in my backyard?**

**Answer:** There are a variety of devices advertised that are designed to attract mosquitoes then kill them by electrical shock or other means. While many of these will kill some mosquitoes, there can be drawbacks. First, they will also attract and kill beneficial insects. Some use a light source or emit carbon dioxide to attract mosquitoes and thus may draw in more mosquitoes than would have otherwise been in the area. Effectiveness can vary, and there is little scientific data available to help guide the consumer in purchasing such devices, many of which are fairly expensive. In general, it is advisable to concentrate your mosquito control efforts on eliminating mosquito breeding habitat, preparing your home to keep mosquitoes out, and taking personal precautions against being bit by mosquitoes.

**Question: There are so many adult mosquitoes in my backyard that I want to spray them to get rid of them. How do I go about this?**

**Answer:** First of all, it is important to note that not all flying insects are mosquitoes. During the summer, there are other bugs such as crane flies and certain midges and gnats that may look like mosquitoes but which don't bite and don't spread West Nile virus. Killing adult mosquitoes (or "adulticiding") may not be the best way to protect you from mosquito bites. Avoid the bite by staying inside during the feeding time of adult mosquitoes. Wear protective clothing when mosquitoes are biting, and consider applying insect repellent to exposed skin. Since the adult mosquitoes you see now are capable of laying eggs, find and eliminate sources of stagnant water (i.e., still or standing water present at least several days) on your property to reduce new generations of mosquitoes.

Although the use of sprays or other products to kill adult mosquitoes is not normally recommended by Public Health, they are a legal although not the most effective solution to mosquito problems. We recommend you contact a licensed pesticide applicator, who is knowledgeable about adult mosquito control and the rules regarding use of pesticides and the conditions under which they may be applied that may include weather, temperature, wind speed, and direction. If adulticiding is being considered for mosquito control it is important that the applicator choose the least toxic chemical for the environment to be treated.

## COMMON WORDS

- **Larviciding:** Killing immature mosquito larvae, before they reach adulthood. Larvicides are generally thought to be more effective than adulticides. Many larvicides (such as *Bacillus thuringiensis israelensis*) come in the form of pellets or small donut-shaped "dunks".
- **Adulticiding:** Killing adult mosquitoes, after they reach adulthood and can fly. Adulticides are often sprays or foggers.
- **NPDES:** National Pollutant Discharge Elimination System (NPDES) Permit - the permit required from the Washington State Department of Ecology before larviciding in any water that has the potential to run into streams, lakes, drains, or other water.
- **Commercial Pesticide Applicator:** A joint company/person who is **licensed through** the Department of Agriculture. This license allows the company/applicator to apply certain pesticides. A Commercial Pesticide Applicator needs an aquatic, public health or statewide endorsement on his/her license in order to apply larvicides to water other than completely contained ornamental-type fountains or ponds.
- **West Nile virus:** A virus that can cause serious human illness or death in rare cases; it is transmitted through the bite of an infected mosquito.